

**Worksheet 3-6: Solving Quadratic Equations by Factoring****Basic Skills/Knowledge Required for Solving Quadratic Equations:****1. Factoring**

- Common Factoring
- Factoring Trinomials as Binomial Factors

**2. Zero Product Property**

- When a number is multiplied by zero, the result is always zero.
- The zero product property states that, if the product of two numbers is zero, then one or both of the numbers must be zero.
- Thus, if  $ab = 0$ , then  $a = 0$ , or  $b = 0$ ,  
or  $a = 0$ , and  $b = 0$ .

**Apply factoring and the Zero Product Property to solve quadratic equations in the form  $ax^2 + bx + c = 0$  algebraically:**

**Step 1: Writing the given equation in the form  $ax^2 + bx + c = 0$**

**Step 2: Factor  $ax^2 + bx + c$**

**Step 3: Set each factor equal to zero (Zero Product Property)**

**Step 4: Solve for  $x$  for each factor**

Practice:

1. Solve.

(a)  $x^2 + 5x = 0$

(b)  $x^2 + 7x + 12 = 0$

(c)  $x^2 - 121 = 0$

(d)  $2x^2 - 8x - 10 = 0$

(e)  $x^2 = 49x$

(f)  $m^2 = 10m - 24$

(g)  $y(y+1) = 12$

(h)  $(a-5)(a-8) = 28$

2. The area of the rectangle can be modelled by  $x(x-7) = 44$ . The length is  $x$  metres. The width is  $(x-7)$  metres. Find the dimensions of the rectangle.

**Answers:** 1. (a)  $x = -5$  or  $0$ , (b)  $x = -3$  or  $-4$ , (c)  $x = -11$  or  $11$ , (d)  $x = -1$  or  $5$ , (e)  $x = 0$  or  $49$ ,  
(f)  $x = 4$  or  $6$ , (g)  $x = 3$  or  $-4$ , (h)  $x = 12$  or  $1$ ;  
2. Solve  $x^2 - 7x - 44 = 0$ .  $x = 11$  or  $-4$  (Reject). Length =  $x = 11$  m. Width =  $x - 7 = 4$  m.